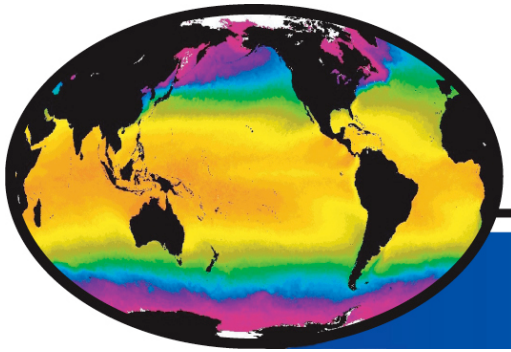

GHRSST-PP

GODAE High Resolution Sea Surface Temperature Pilot Project

Status of the GHRSST Long Term Stewardship and Reanalysis Facility

Presented by: Kenneth S Casey, Ph.D.

NOAA National Oceanographic Data Center

With contributions from Drs. Richard Reynolds and Tom Smith, NCDC

http://www.nodc.noaa.gov/sog/ghrsst

Overview

- Big Picture of NOAA Involvement
  - NOPP-funded efforts at ORA and ESRL
  - Base-funded Long Term Stewardship and Reanalysis (LTSRF) at NODC and NCDC
- LTSRF Overview and Status
- Future opportunities for NOAA in GHRSST

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

Current NOAA Involvement

NOAA in GHRSST

LTSRF
- Architecture
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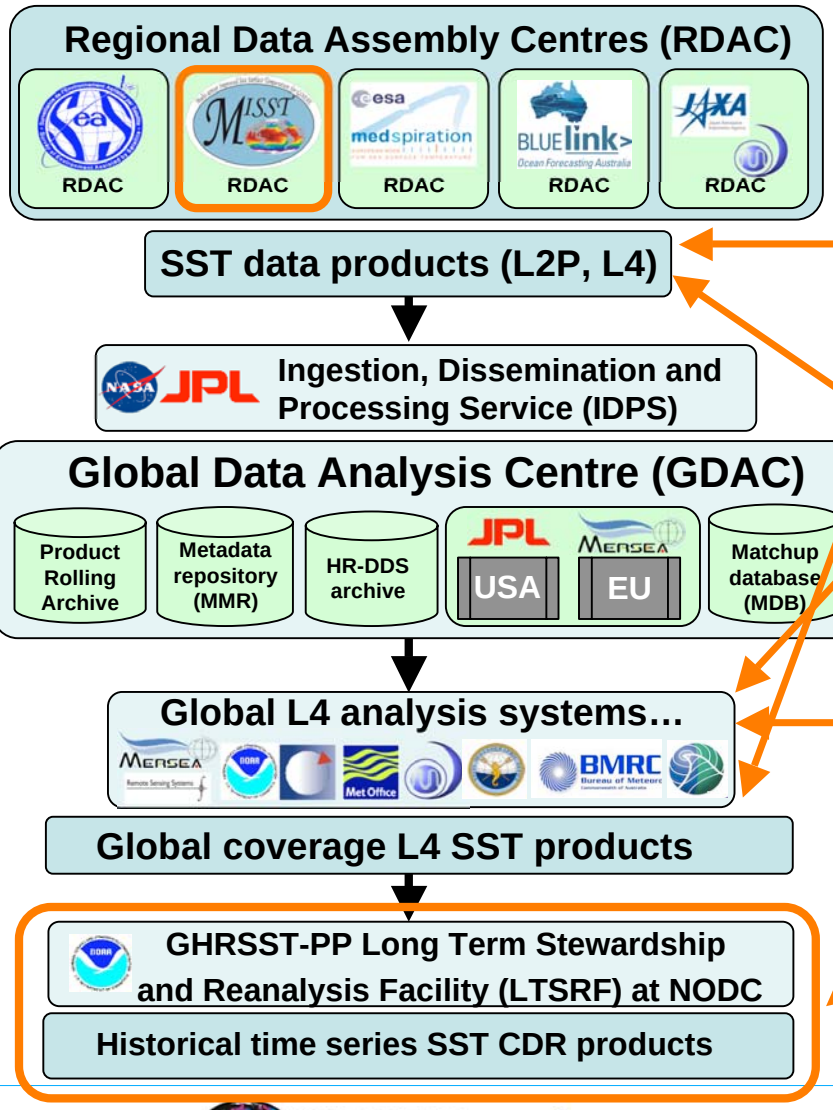
Future NOAA Opportunities?



ORA: real time GOES L2P and POES/GOES analysis

ESRL: Optimal analysis algorithms, diurnal variability, error characterization

NCDC: Optimal analysis and blending algorithms

NODC: Archive, long term stewardship, and reanalysis CDRs

Regional/Global Task Sharing

NOAA in GHRSST

LTSRF
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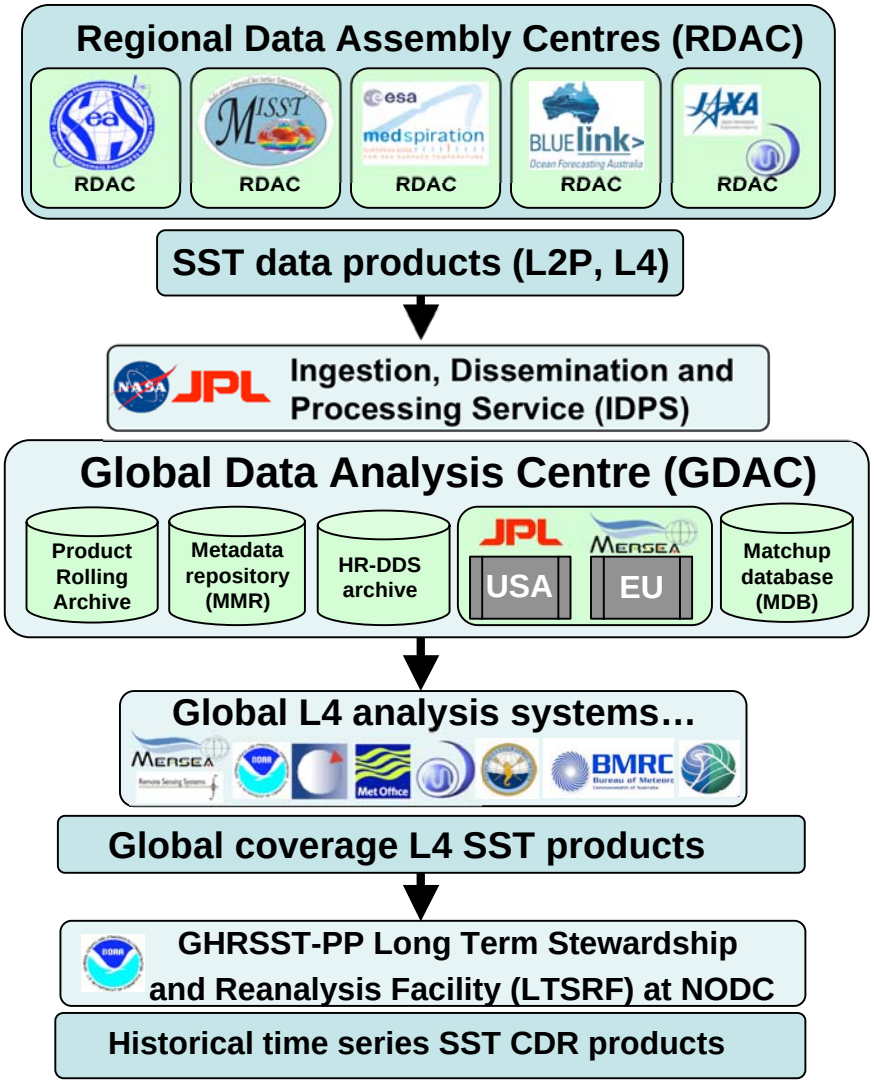
Future NOAA Opportunities?



GHRSST-PP
GODAE High Resolution Sea Surface Temperature Pilot Project

A working demonstration of GEOSS!

GEOSS - Integrated Data Stewardship

NOAA in GHRSST

LTSRF
- Architecture
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- L4 Analysis

Future NOAA Opportunities?

- Focuses on interfaces
- Adheres to standards (e.g. IOOS DMAC)
  - Online Master Metadata Repository and comprehensive metadata (FGDC, DIF, CF)
  - Online browse via Live Access Server
  - Data access via OAS, ftp, http, OPeNDAP
  - Formal archive at NODC
- Values real time and delayed mode users
- Emphasizes science development and feedback at all levels

GHRSST LTSRF

NOAA in GHRSST

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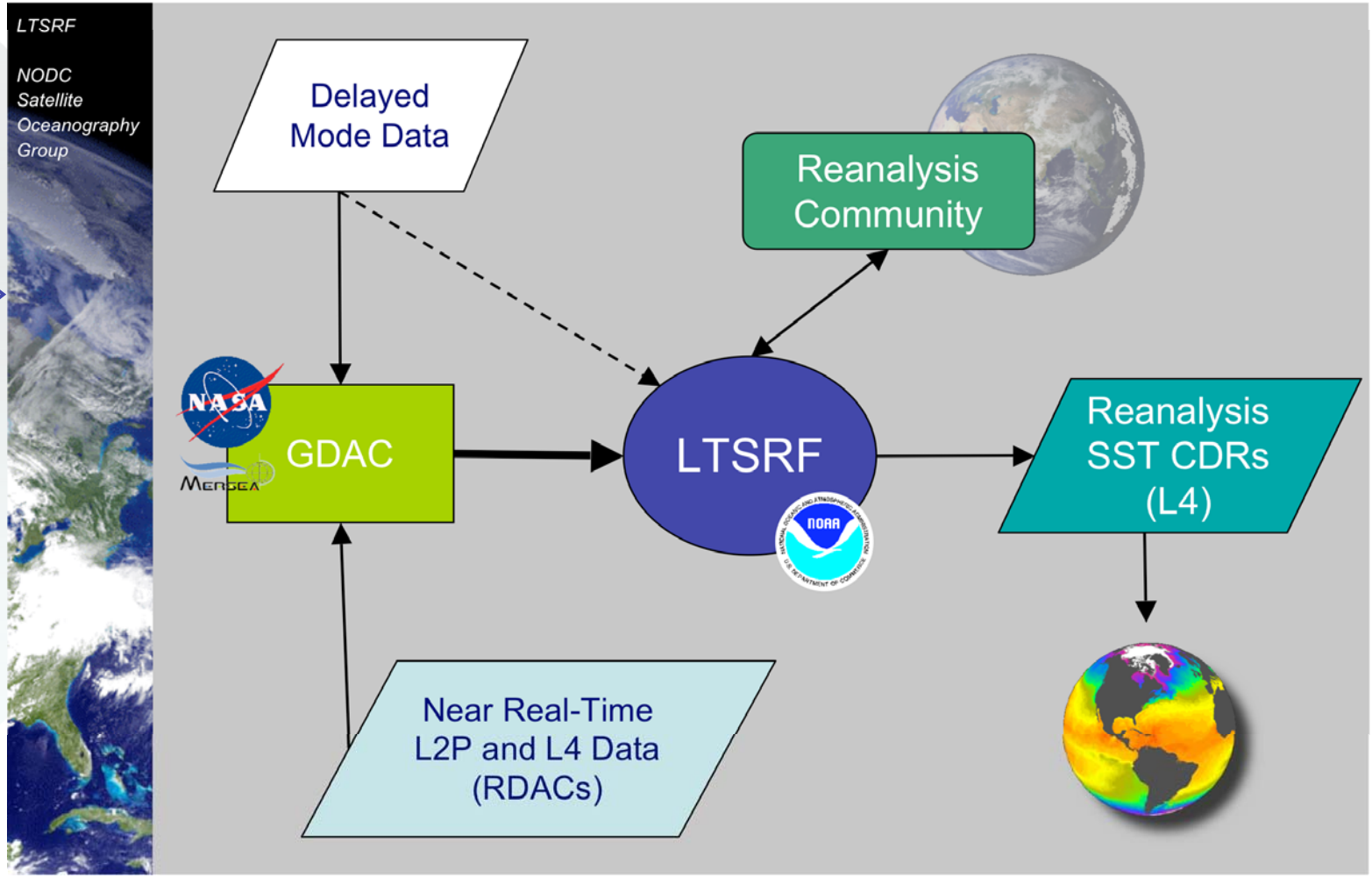
Future NOAA Opportunities?

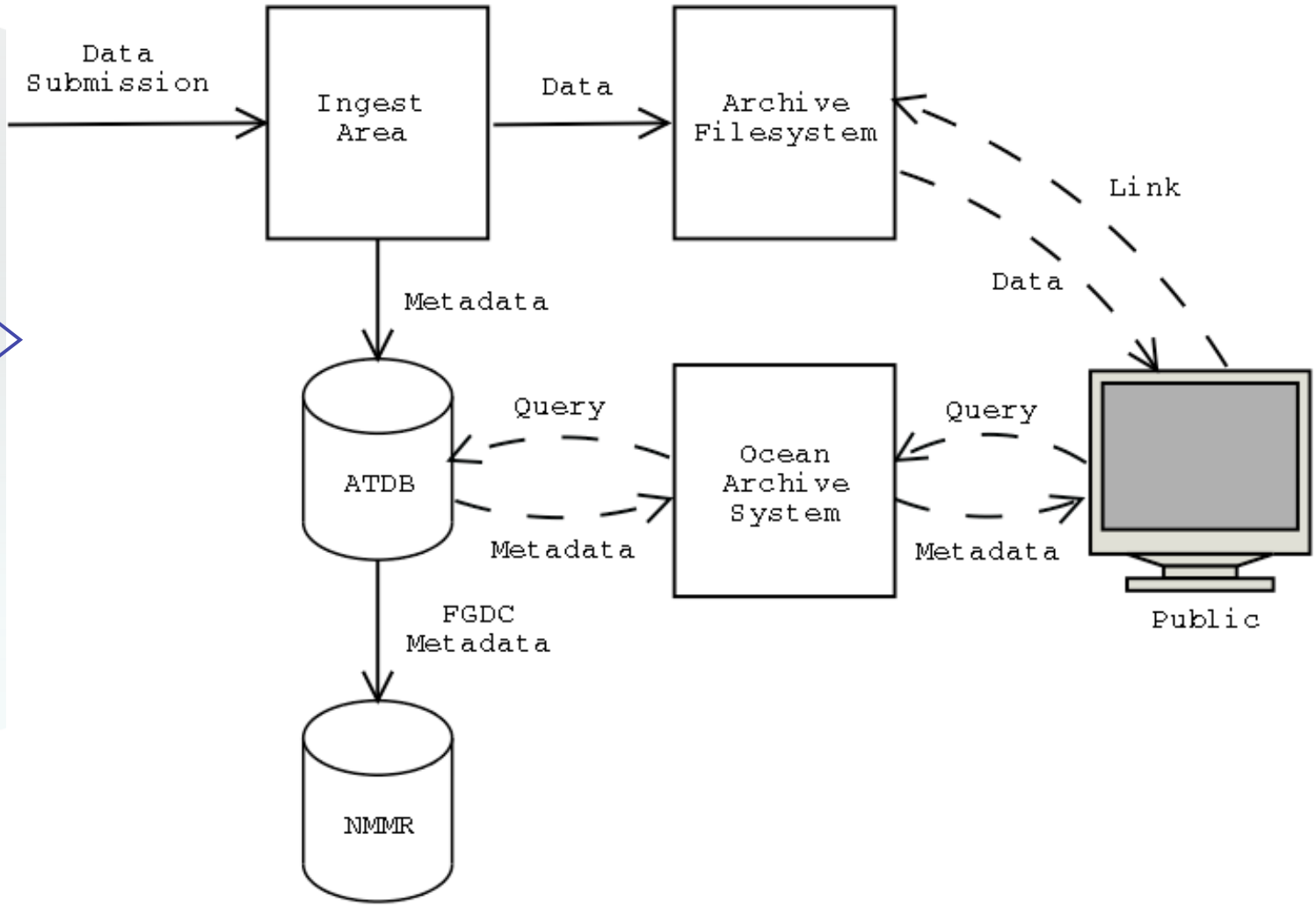


NODC Archive Management System

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?



NODC Archive Management System

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
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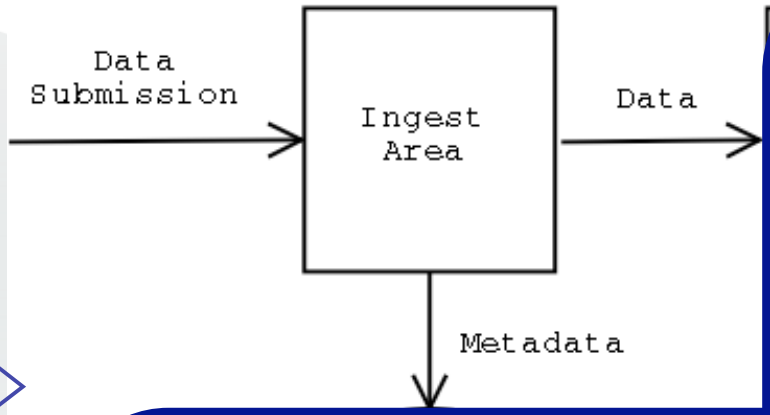
- L4 Analysis

Future NOAA Opportunities?



Ingest Area

- Temporary Area for receipt of data
- Data go to *Archive File System (AFS)*
- Metadata are loaded to the Accession Tracking Database (ATDB) and NOAA Metadata Management Repository (NMMR)

NODC Archive Management System

NOAA in GHRSST

LTSRF
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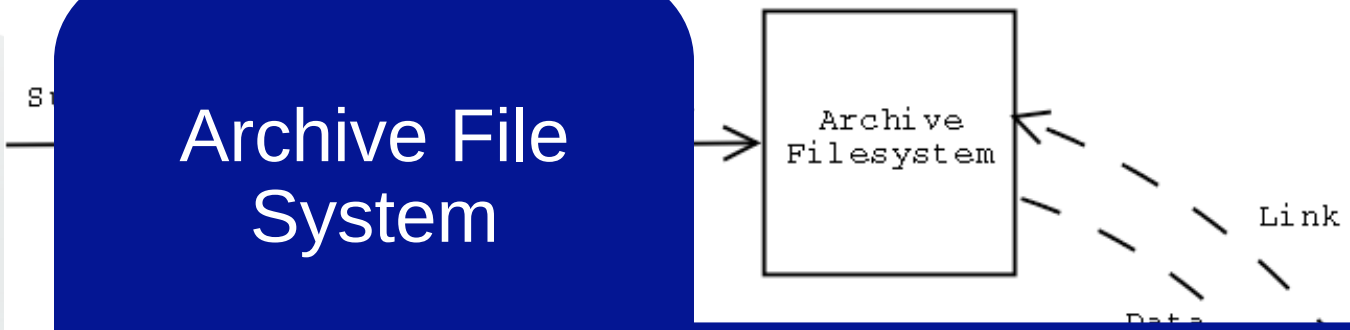
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

Archive File System



- Sets uniform directory structure per “accession”
- Supports dataset versioning
- Provides perpetual URLs
- Exactly preserves original information
- Checksums all files
- Periodically scans for viruses
- Conducts regular backups

NODC Archive Management System

NOAA in GHRSST

LTSRF
- Architecture
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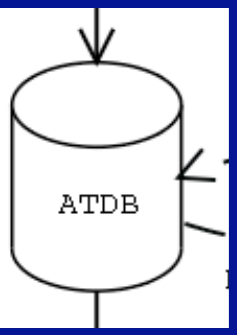
Future NOAA Opportunities?

Accession Tracking Data Base



- Assigns unique accession numbers
- Maintains internal data management information
- Maintains a controlled vocabulary (Persons, Projects, Institutions, Platforms, etc.)

NODC Archive Management System

NOAA in GHRSST

LTSRF
- Architecture
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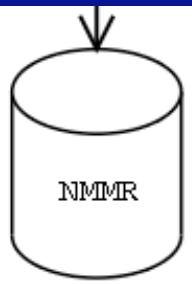
Future NOAA Opportunities?

NOAA Metadata Management Repository

Web based system for managing FGDC metadata

- Uses a Simple Object Access Protocol (SOAP) interface
- Supports FGDC profiles (base, NBII, and Remote Sensing)
- Provides QC tools, including validation, link checking, thesaurus usage, multiple record comparison
- Enables field-based searches (title, keywords, locations, etc.) via Z39.50 server



NODC Archive Management System

NOAA in GHRSST

LTSRF
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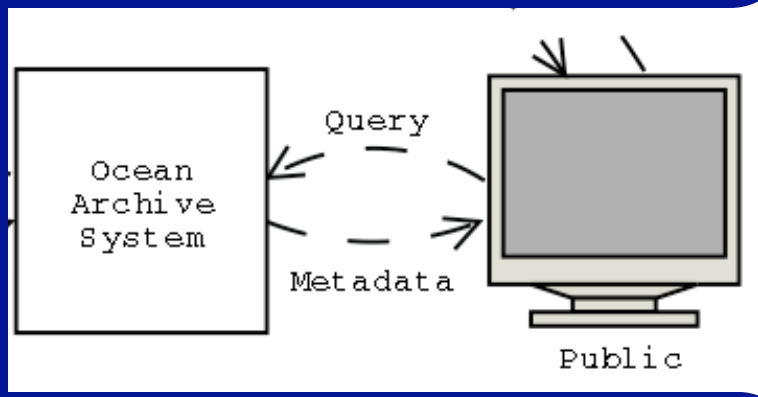
Future NOAA Opportunities?

Ocean Archive System

http://www.nodc.noaa.gov/search/prod/

- Allows users to search the ATDB by date, location, platform, instrument type, data type, project, etc.
- Connects users to the AFS for downloading data
- Provides checksums to ensure validity



NODC Archive Management System

NOAA in GHRSST

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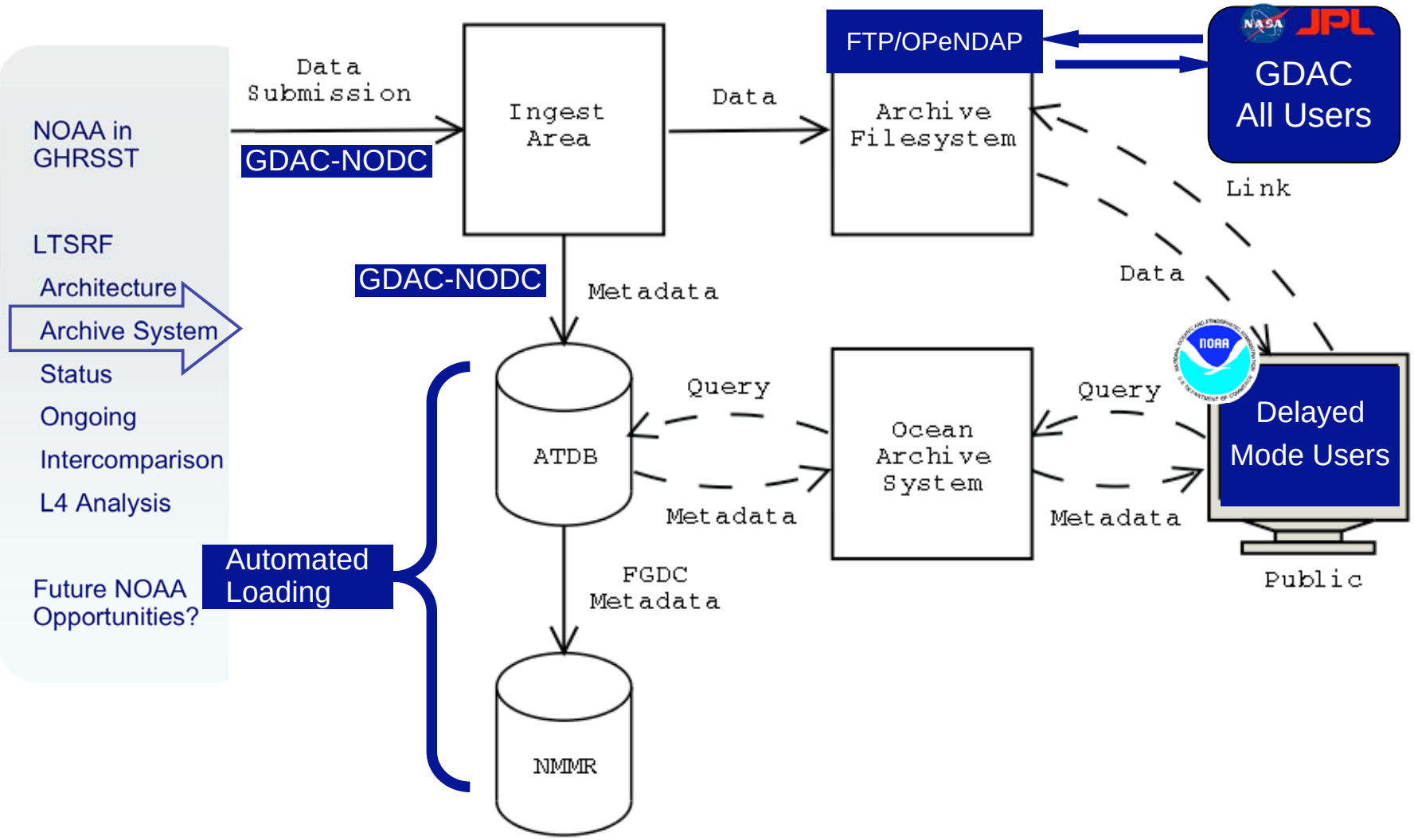
Future NOAA Opportunities?



NODC Archive Management System

NOAA in GHRSST

LTSRF
- Architecture
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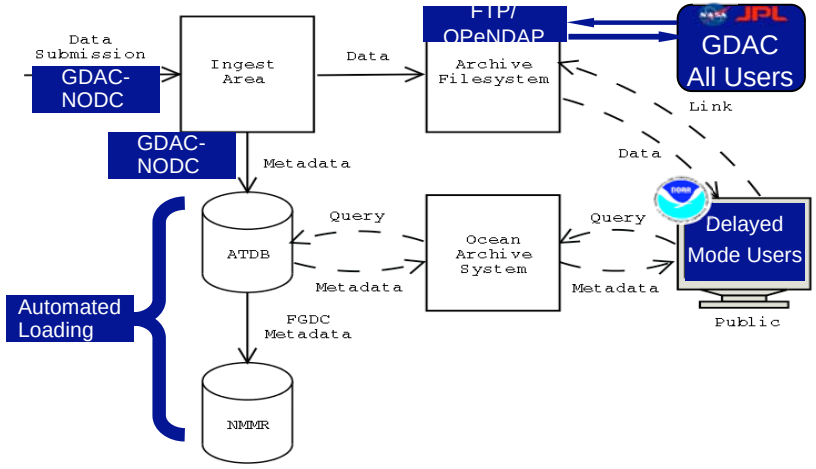
- L4 Analysis

Future NOAA Opportunities?

- Data Ingest: Index file and ftp pull from GDAC
- Metadata: GDAC combines DSD/FRs to provide base FGDC, then augmented and completed at NODC automatically
- ATDB/NMMR: automatic loading/verification
- FTP/OPeDAP: symbolic links
- User Access:
  - GDAC: all (via NODC)
  - NODC: delayed mode



LTSRF Status

- Daily, NODC acquires all data >30 days old from GDAC
- Receiving L4 and L2P from AMSRE; AVHRR16 and 17 GAC, LAC, and HRPT; SEVIRI; AATSR; and TMI; also HRDDS
- Data from ~ 2900 accessions ingested to date (~73000 files, ~850 GB uncompressed)
- Data rate growing quickly to ~30 TB/year from present ~ 1 TB/year

LTSRF Status

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

- Automated daily data acquisition
- Checksums for all data streams
- Offsite tape backups
- Data mirror at NGDC in Boulder
- Media migration policy
- Full metadata system for EUR RDAC, now implementing REMSS
- All data online and accessible via multiple protocols (soon)

"LTS" in LTSRF established!

LTSRF Status

NOAA in GHRSST

LTSRF

Architecture

Archive System

Status

Ongoing

Intercomparison

L4 Analysis

Future NOAA Opportunities?

- Reanalysis “community building”:
  - Since Nov 2004: CLIVAR Ocean Reanalysis workshop, MARCDAT-II, GHRSST6, NOAA Office of Climate Observations, etc.
  - Encouraged Europe with its (A)ATSR retrospective L2P reformatting *and* Pathfinder-like reprocessing
  - Chairing 2006 Ocean Sciences Meeting special session on Ocean CDRs from Space
  - Hosted NOAA-GHRSST meeting at NODC, 7 November 2005

Ongoing LTSRF Activities

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

- Reanalysis User Requirements Document
- Reanalysis facility scoping
- Full automation of ATDB and NMMR metadata ingest at NODC
- Massive compression tests completed - analysis of results underway
- netCDF-4/HDF5 evolution “tracking”
- **Intercomparison framework with GCOS SST and Sea Ice Working Group**
- **New L4 analysis development with NCDC**

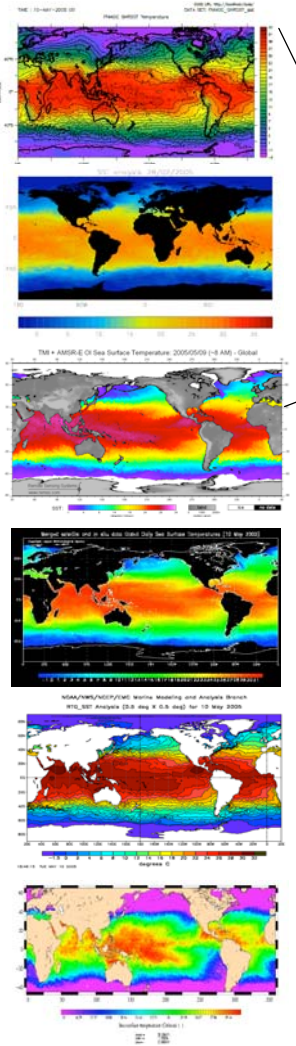
Intercomparison Framework

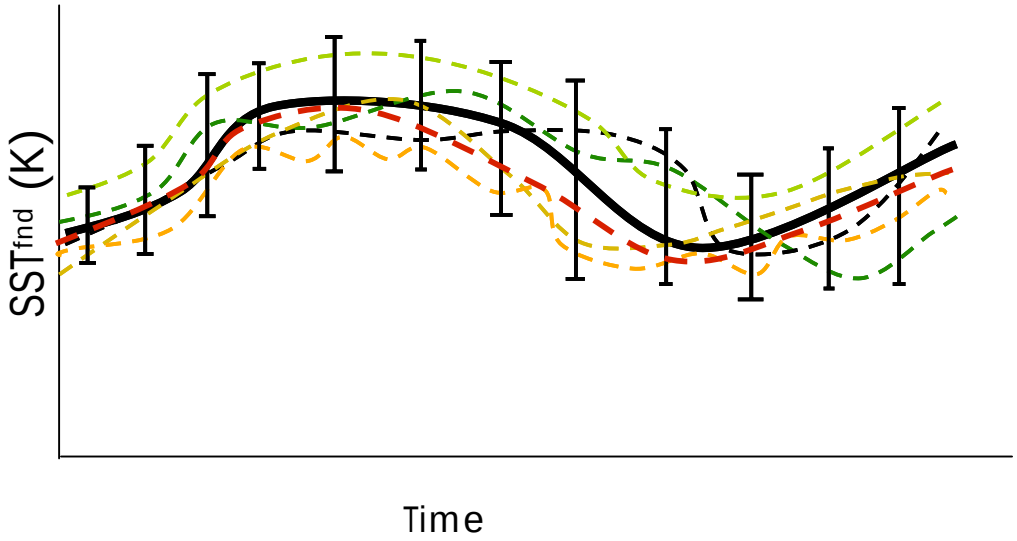
NOAA in GHRSST

LTSRF

- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?



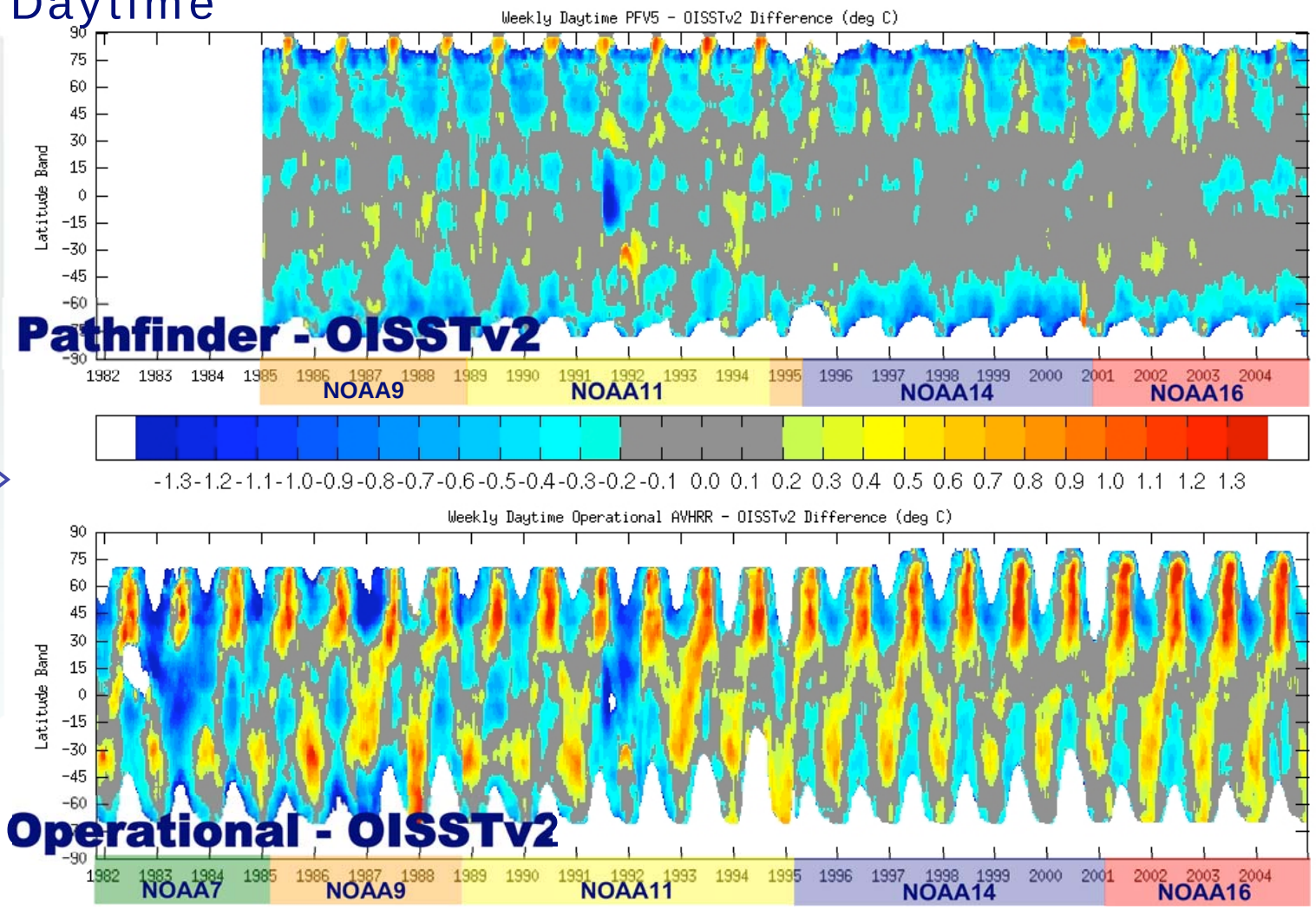


- Initial ensemble approach for GHRSST Reanalysis - preserves individual autonomy, stimulates better products and science
- Framework to deliver the ensemble products and intercomparisons under development

Intercomparison Framework

- NOAA in GHRSST
- LTSRF
  - *Architecture*
  - Archive System
  - Status
  - Ongoing
  - Intercomparison
  - L4 Analysis
- Future NOAA Opportunities?

Daytime



Intercomparison Framework

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

- Initially two-tiered: monthly 5-degree and weekly 1-degree
- Consisting of time series, climatologies, and uncertainties (when available)
- Will build to finer scales
- Agreements in place or being pursued with:
  - AVHRR Pathfinder V5
  - Operational AVHRR
  - OISSTv2
  - HadSST2
  - ERSST
  - Kaplan SST
  - (A)ATSR
  - Possibly HadISST2, AMSR(E), OSTIA, JMA

L4 Analysis Developments

NOAA in GHRSST

LTSRF

- Architecture
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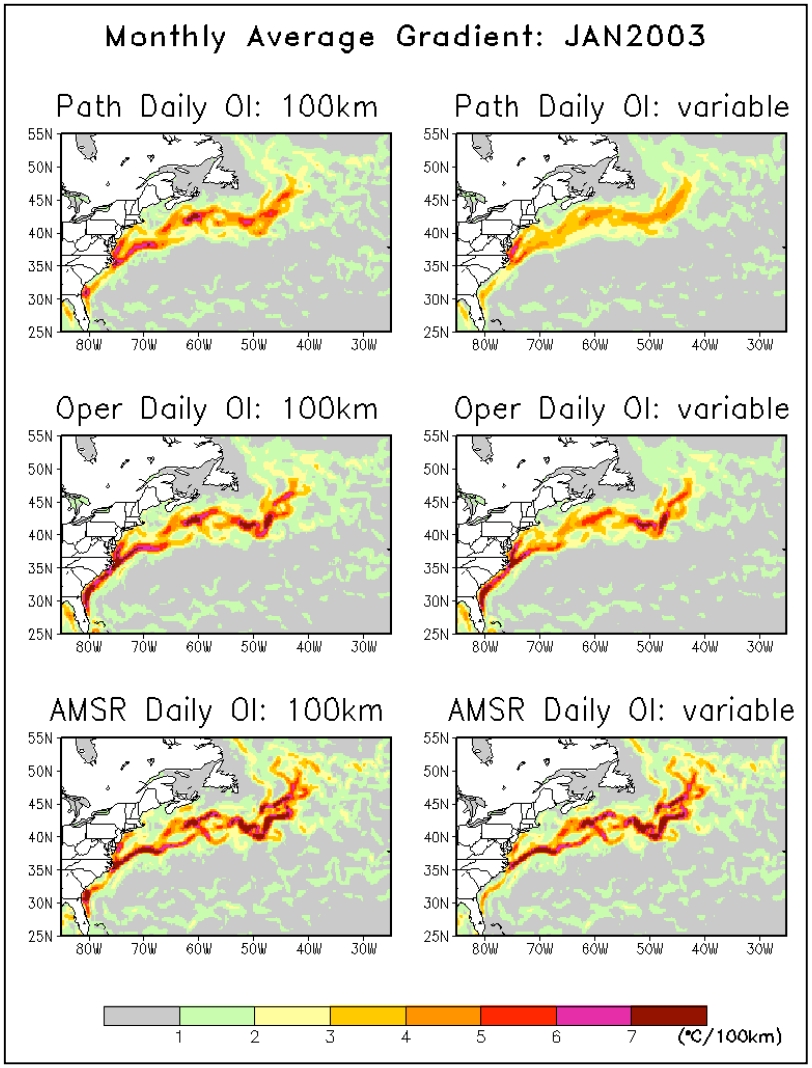
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

- Aim: finer spatial-temporal scales and more inputs
- AMSR gradients not sensitive to scale changes
- Operational AVHRR shows some reduction with increasing scales
- Pathfinder AVHRR shows the strongest reduction because Pathfinder data are the sparsest at QF=7
- As data become sparser, OI gradients weaken more as scales increase

Credit: Tom Smith and Dick Reynolds, NCDC



L4 Analysis Developments

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
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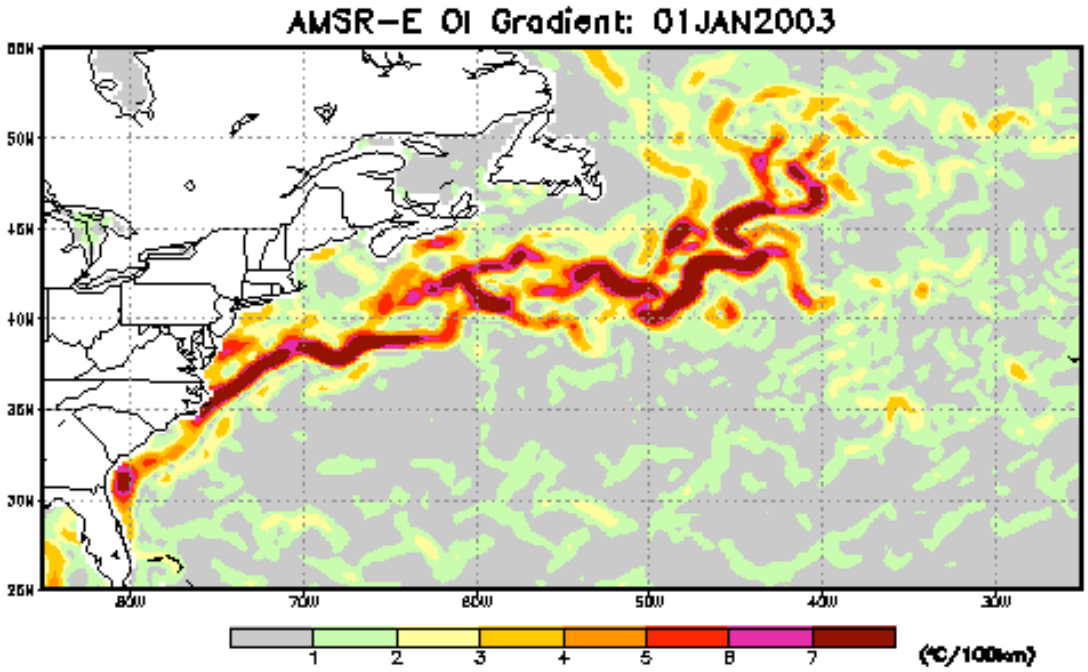
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

- Gradients are quasi-stationary (in some places) due to topography
- Thus, even limited AVHRR data are useful!



Gradients in Daily OI using AMSR-E for January - March 2003

Credit: Tom Smith and Dick Reynolds, NCDC

L4 Analysis Developments

NOAA in GHRSST

LTSRF
- Architecture
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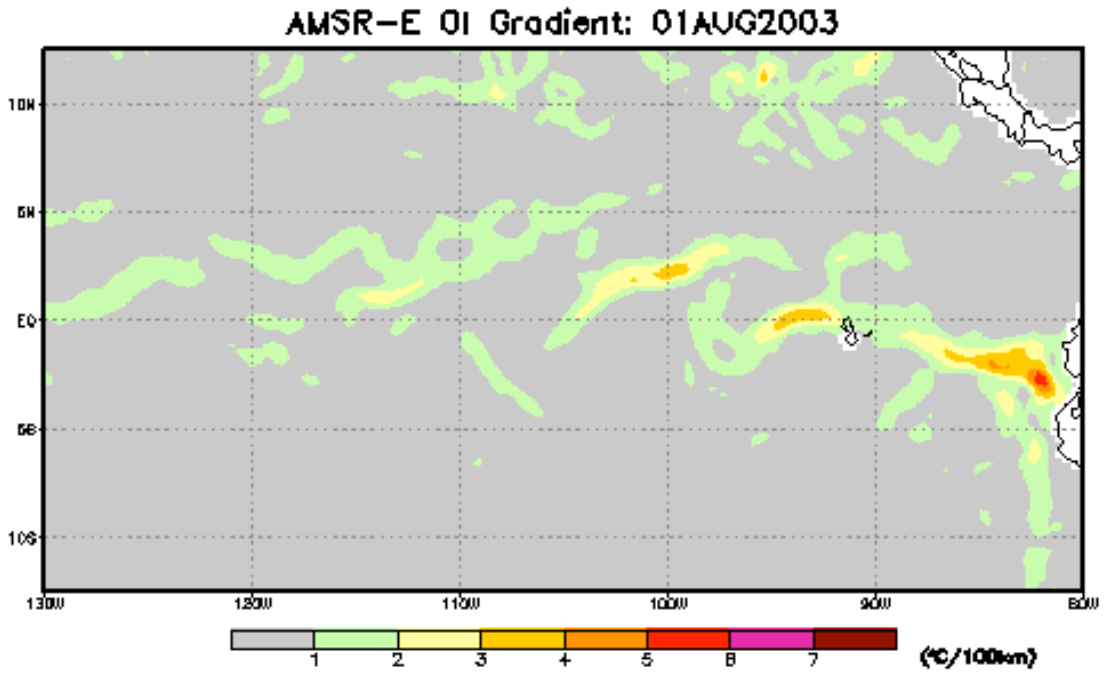
Future NOAA Opportunities?

- Gradients propagate in other places
- Thus, limited data are not as useful
- Monthly averages wipe out gradients



Gradients in Daily OI using AMSR-E for August - October 2003

Credit: Tom Smith and Dick Reynolds, NCDC

L4 Analysis Developments

NOAA in GHRSST

LTSRF

Architecture

Archive System

Status

Ongoing

Intercomparison

L4 Analysis

Future NOAA Opportunities?

- *A "bridge" to the first GHRSST Reanalysis*
- Preliminary analysis with Pathfinder AVHRR to be ready by Christmas 2005
- Reanalysis efforts will extend…
  - Daily OI analysis using Pathfinder AVHRR back to January 1985
  - Daily OI analysis using Pathfinder AVHRR and AMSR back to June 2002
  - Additional satellite data to be tested and possibly used

BIG ADVANTAGE OF NEW ANALYSIS

Two sets of satellite data with independent errors

Future Opportunities for NOAA

NOAA in GHRSST

LTSRF
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Future NOAA Opportunities?

- Getting GOES(-R) into L2P
- NPP/NPOESS EDRs into L2P
- Sustained GHRSST Reanalysis at LTSRF
- AVHRR Pathfinder as L2P
- New products: Ultra-high resolution analyses for US Coasts/EEZ
- Transition to CLASS Archive

For More Information

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

Dr Kenneth Casey
Chair, GHRSST Reanalysis Technical Advisory Group
NODC Lead for Long Term Stewardship and Reanalysis Facility
NOAA National Oceanographic Data Center
1315 East West Highway, Silver Spring MD 20910, USA
http://www.nodc.noaa.gov/sog/ghrsst
Kenneth.Casey@noaa.gov

AFS Structure

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
- Status
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?

NNNNNNN/

All accessions have a 7 digit accession number.

01-Version.md5

Each version has a checksum file.

01-Version/

NODC_readme.txt

This file explains this directory structure.

ABOUT/

This directory contains information about the accession.

journal.txt

This file includes notes about this accession and NODC actions taken, including unpacking information, format manipulations or transformations, errors or problems encountered while manipulating the original data files, etc.

DATA/

0-DATA/

The data exactly as received from the originator.

1-DATA/ *Translations of the original submission, such as unzipping, untarring, and converting proprietary formats to non-proprietary formats (e.g. MS Word to ASCII, MS Excel to CSV, etc.).*

02-Version.md5

02-Version/ *If data provider makes changes to data after original submission, a new version is created with updated files.*

OAS Parameters

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
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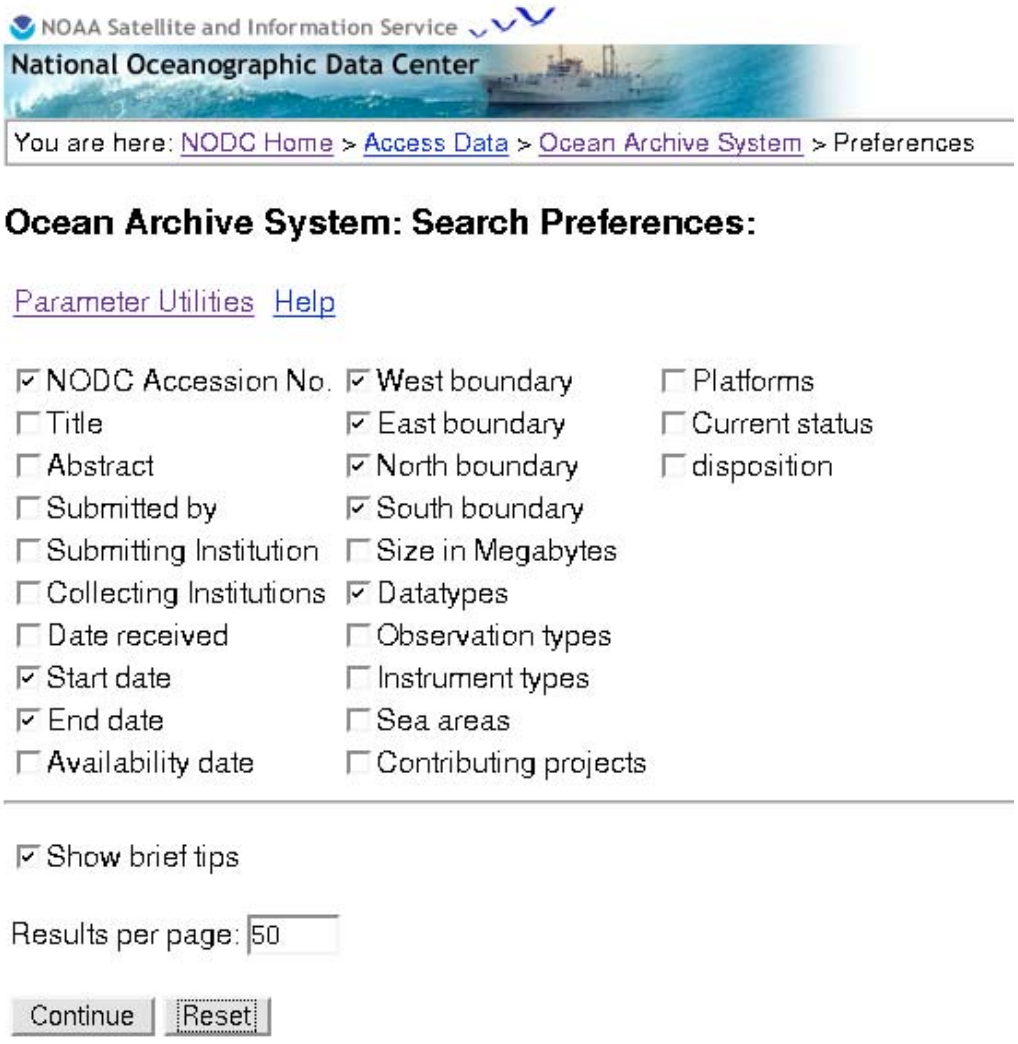
- Ongoing
- Intercomparison
- L4 Analysis

Future NOAA Opportunities?



OAS Search Accessions

NOAA in GHRSST

LTSRF
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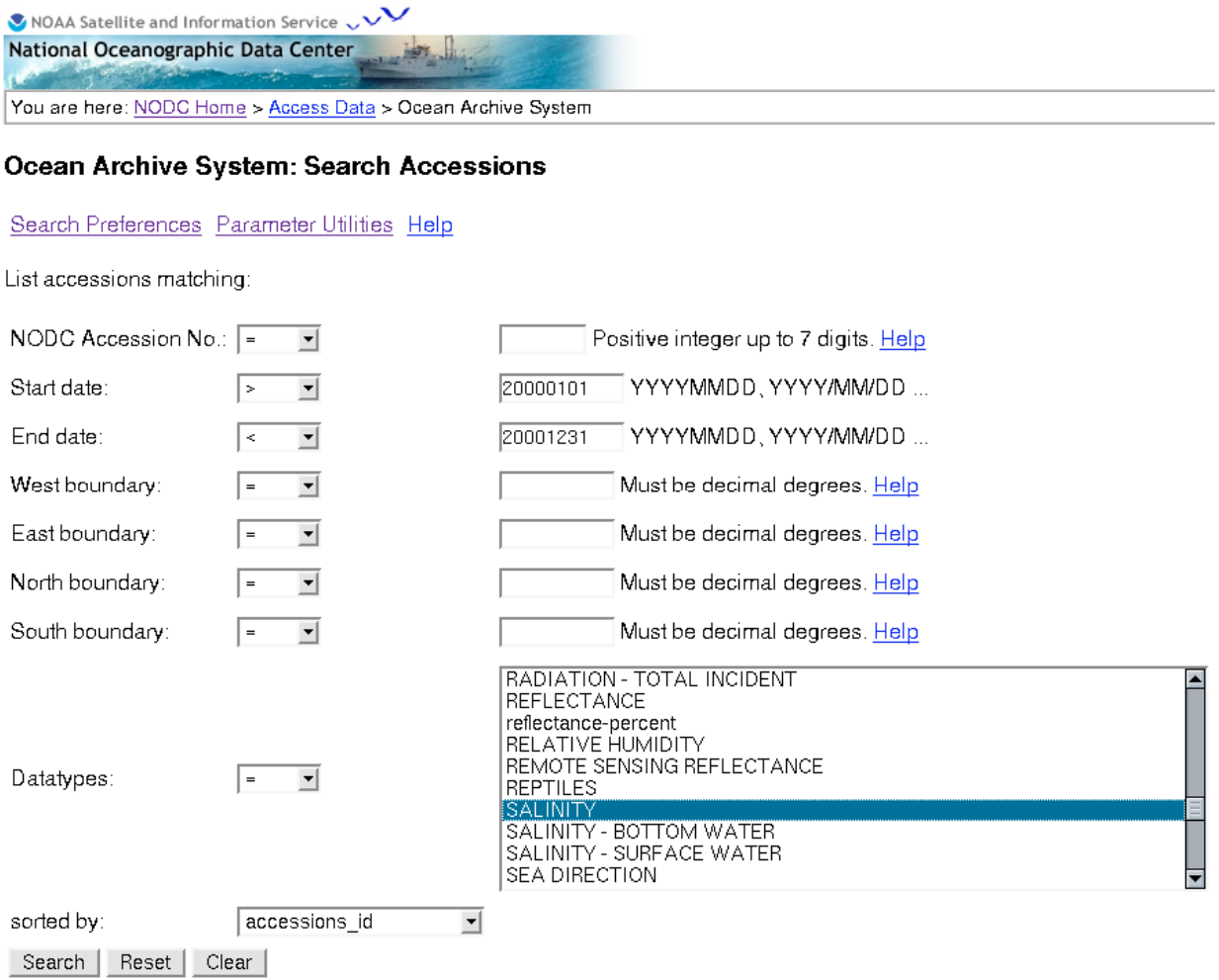
Future NOAA Opportunities?



OAS Search Results

NOAA in GHRSST

LTSRF
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Future NOAA Opportunities?

NOAA Satellite and Information Service

National Oceanographic Data Center

You are here: NODC Home > Access Data > Ocean Archive System > Results page: 1

Ocean Archive System: Accessions Search Results: page: 1 of 1

Help

Result page: **1** New Search

Query returned: **42** records

	NODC Accession No.	Date received	Datatypes	Sea areas
details	0000036	2000-06-14	SALINITY	Gulf of Alaska
details	0000037	2000-06-16	SALINITY	Bering Sea, Gulf of Alaska
details	0000117	2000-04-18	SALINITY	NE Pacific (limit-180)
details	0000124	2000-04-25	SALINITY	Bering Sea, Gulf of Alaska
details	0000133	2000-05-02	SALINITY	Gulf of Thailand
details	0000141	2000-05-10	SALINITY	Coastal Waters of California
details	0000175	2000-06-22	SALINITY	NE Pacific (limit-180)
details	0000246	2000-08-15	SALINITY	Gulf of Alaska
details	0000248	2000-08-16	SALINITY	NE Pacific (limit-180)
details	0000250	2000-08-22	SALINITY	Gulf of Alaska
details	0000254	2000-04-01	SALINITY	World-Wide Distribution
details	0000255	2000-05-01	SALINITY	World-Wide Distribution

OAS Accession Detail

NOAA in GHRSST

LTSRF
- Architecture
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Future NOAA Opportunities?

Ocean Archive System accessions Detail for accessions_id 403

Download this accession Help

NODC Accession No.:	0000403
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Abstract:	
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Submitting Institution:	MEDS
Collecting Institutions:	
Date received:	2000-11-29
Start date:	2000-06-01
End date:	2000-11-29
Availability date:	2000-11-29
West boundary:	34.12
East boundary:	29.9
North boundary:	76.594
South boundary:	-45.0667
Number of observations:	7778
Size in Megabytes:	6.944
Datatypes:	SALINITY, TEMPERATURE - WATER
Observation types:	physical, profile
Instrument types:	buoy - moored buoy, profiling floats, buoy - TAO buoy, bathythermograph - XBT
Sea areas:	World-Wide Distribution
Contributing projects:	GTSPP, SOOP, WOCE
Platforms:	
Supplementary Info:	
version:	1
Current status:	Archived
disposition:	Online

OAS Data

NOAA in GHRSST

LTSRF
- Architecture
- Archive System
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- Intercomparison
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Future NOAA Opportunities?

Index of /archive/arc0001/0000403/01-version/data/0-data

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200011062000.meds	10-Sep-2001 12:41	552k	
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